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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/040,058 | 10/26/2001 | Alexander I. Krymski | 08305-087002 | 9431 |

7590 04/05/2005

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EXAMINER

LUU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,058

Applicant(s)

KRYMSKI ET AL.

Examiner

Thanh X. Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,13-15,20-22 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,13-15,20-22 and 25-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 10, 2005 has been entered.

Claims 1, 4, 13-15, 20-22 and 25-30 are currently amended.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

3. Claim 28 is objected to because of the following informalities:

In claim 28, "same sample circuit" lacks proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1, 4, 20, 22, 25, 26, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (Fig. 2), hereinafter AAPA, in view of Merrill et al. (U.S. Patent 6,369,853).

Regarding claims 1, 4, 20, 22, 25, 26, 28 and 29, AAPA discloses (see Fig. 2) an active pixel sensor (APS), comprising: an N-well; a photoreceptor outside the N-well; and an PMOS frame shutter within the N-well, the frame shutter including a first storage area (under photo reset) for receiving charges from the photoreceptor, a second storage area (under memory reset) for receiving charges from the first storage area, a sample and hold circuit (sample) for gating charges from the first storage area to the second storage area and respective reset circuits for the first and second storage areas; and an APS readout (230) for receiving charges from the second storage area of the frame shutter. AAPA also discloses a source follower transistor and the sample and hold circuit is in direct connection to the sample and hold circuit. AAPA does not specifically disclose a P-well and an NMOS frame shutter within the P-well. Merrill et al. teach (see Figs. 6 and 7) an APS comprising: a P-well (128); a photoreceptor (at 122) outside the P-well; and an NMOS frame shutter (84, 88; see col. 7, lines 28-35) within the P-well, and NMOS transistors within the P-well. Merrill et al. further recognize (see col. 8, lines 5-45) the advantages of having an NMOS frame shutter in a P-well. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement a P-well and an NMOS frame shutter in the apparatus of AAPA in view of Merrill et al. to reduce photocurrent leakage and improve detection as taught.

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6. Claims 13-15, 21, 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Merrill et al. and further in view of Lee et al. (U.S. Patent 5,625,210).

Regarding claims 13-15, 21, 27 and 30, AAPA and Merrill et al. disclose the claimed invention as set forth above. AAPA and Merrill et al. do not specifically disclose a pinned photodiode. Lee et al. teach (see col. 2, lines 28-31) providing a pinned photodiode in an active pixel sensor. Lee et al. recognize (see col. 2, lines 28-31) that pinned photodiodes are advantageous in APS. Furthermore, it would require only routine skill in the art to choose the specific type of photoreceptor. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a pinned photodiode in the apparatus of Merrill et al. in view of Lee et al. as desired for improved responses as taught.

Response to Arguments

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is 571-272-2441. The examiner can normally be reached on M-F 6:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thanh X Luu
Primary Examiner
Art Unit 2878

04/2005